



8020 RAPI-CORE

Innovative Core Material for use with Rapi-Ply Technology

Rapi-Core consists of a layer of light weight pressure stabilized polyester felt with a honeycomb structure applied to a layer of resin film. The molding material therefore has the appearance of a dry reinforcement on one face and resin on the other. Rapi-Core is ideal for use in a variety of structural items for Automotive, Marine and Industrial Applications.

8020 resin is a new generation of toughened Epoxy resin systems offering an excellent balance of mechanical properties. The resin system has been developed to offer a long out-life, flexible cure schedules and high flow characteristics to ensure the reinforcement is fully impregnated during the molding process.

CHARACTERISTICS:

- Flexible low to medium cure schedules 70°C (158°F) to 130°C (266°F)
- Excellent combination of lightweight, high strength and toughness
- Outstanding vacuum-only processing capability
- Drapable & Conformable - Tack on one side for use on vertical surface
- Tg 128°C (DSC) (262 °F) after 30 minute cure at 120°C (248 °F)
- 30 days shelf life at ambient temperature 18°C (64 °F)
- 12 months freezer storage life (-18°C)

PROPERTIES	
Resin Density	1.2 g/cm ³ (79.3lbs/ft ³) at 23°C (73°F)
Rapi-Core Laminate Density	0.57 g/cm ³
Tg after 30 mins at 120°C (DSC)	128°C (262°F)



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PRODUCT RANGE:

The 8020 Rapi-Ply range includes:

- 8020 Rapi-Ply - Structural system
- 8020 Rapi-Ply SC - Incorporates a light weight syntactic core
- 8020 Rapi-Core - A low weight, low density core material
- 8020 Surface film - Modifies the properties of the laminate surface

All products including 8020 structural prepreg can be co-cured

Please refer to individual product data sheets for further detail.

FORMAT

Rapi-Core consists of a layer of light-weight pressure stabilized polyester with a honeycomb structure applied to a layer of resin film. The molding material therefore has the appearance of a dry reinforcement on one face and resin on the other:



Schematic of 1 ply Rapi-Core

Rapi-Core is available in 2mm, 3mm and 4mm thicknesses.

Description	Width (m)	Arial Weight (g/m ²)	Molded thickness (mm)
8020 Rapi-Core 2mm	1.27	1240	2
8020 Rapi-Core 3mm	1.27	1690	3
8020 Rapi-Core 4mm	1.27	2340	4

All materials are supplied on a roll length of 20 lm.
The standard resin system is pigmented black.



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PROCESSING

Rapi-Core has been developed for use with the Rapi-Ply range. A minimum of one layer of Rapi-Ply must be placed either side of the Rapi-Core to create a sandwich structure.

Following removal from the freezer, allow the materials to reach room temperature before opening the polythene bag, to avoid moisture condensation. Typically, the thaw time for a full roll of material from storage at -18°C (0 °F) will be 4 to 6 hours.

If a surface ply is required, this should be applied directly to the tool face prior to lay-up of Rapi-Ply (refer to Surface Film datasheet).

Lay-up the required number of plies of Rapi-Ply onto the mold surface and then apply a layer of Rapi-Core (resin side towards mold). The required number of plies of Rapi-Ply should then be placed onto the core to complete the sandwich structure.

Note: It is important that dry glass tows are inserted at approx 0.5m intervals between plies of Rapi-Ply and at each side of the Rapi-Core to provide an air evacuation path out of the laminate into the breather.

De-bulking of the laminates should not be necessary under normal circumstances.

Use of a non-perforated release film on the Rapi-Ply surface trimmed to within 25-30mm of Rapi-Ply edge is recommended for the cure.

Rapi-Core is recommended for vacuum only curing processes.

8020 RECOMMENDED CURE TIMES

Cure temperature	Recommended cure time (hrs)
70°C (158°F)	12
80°C(176°F)	5.5
100°C (212°F)	2
120°C (248°F)	0.5



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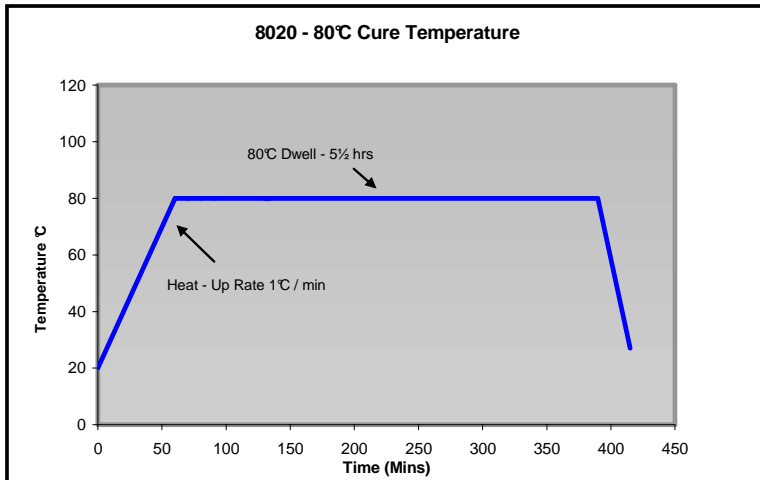
TYPICAL CURE PROFILES

80°C (176 °F) Cure Temperature

Total Time: 6½ hours

1.0°C (1.8 °F) / minute ramp to 80°C (176 °F)

5½ hours dwell @ 80°C (176 °F)



120°C Cure Temperature

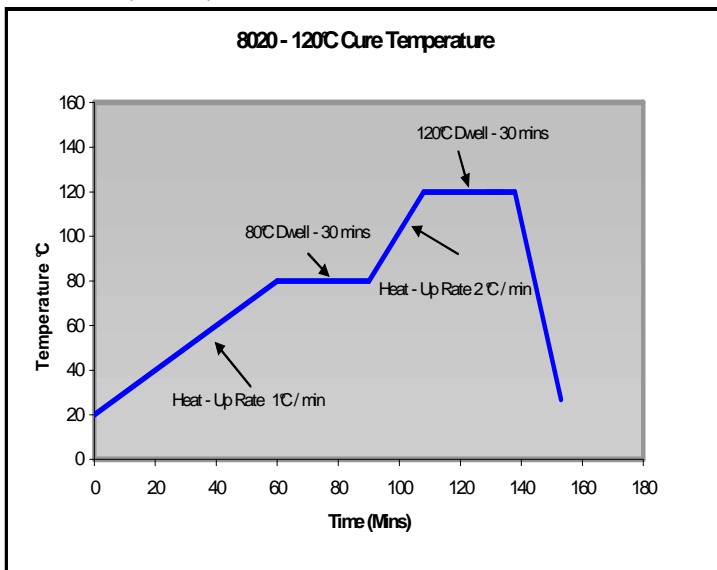
Total Time: 2hours 20 minutes

1.0°C (1.8 °F) / minute ramp to 80°C (176 °F)

30 minute dwell @ 80°C (176 °F)

2.0°C (3.6 °F) / minute ramp to 120°C (248 °F)

30 minute dwell @ 120°C (248 °F)





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EXOTHERM

In certain circumstances, such as the production of thick section laminates, rapid heat up rates or highly insulating masters, 8020 resin can undergo exothermic heating leading to rapid temperature rise and component degradation in extreme cases.

The risk of exotherm increases with lay-up thickness and increasing cure temperature. It is strongly recommended that trials, representative of all the relevant circumstances, are carried out by the user to allow a safe cure cycle to be specified.

POSTCURE

In applications demanding maximum temperature or environmental resistance e.g. 120°C (248 °F) service temperature, it is essential to develop the glass transition temperature to the maximum level by a suitable postcure.

Ramp from initial cure temperature to 120°C (248 °F) at 20°C/hr (36 °F) / hr and hold for 30 minutes minimum, this postcure will result in a Tg of approximately 128°C (262°F).

Laminates may be postcured unsupported unless the size, shape and laminate thickness would allow excessive distortion under self-weight.



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TYPICAL MECHANICAL PROPERTIES (at Room Temperature)

Flatwise Compression (C365-03)* - Standard test method for Flatwise Compression properties of Sandwich Cores

	80°C (176 °F) cure	120°C (248 °F) cure
Compressive Modulus (MPa)	1.94	1.58
Compressive Strength (MPa)	92.51	91.97

Tensile Shear (C273-00)* - Shear properties of Sandwich Core Materials

	80°C (176 °F) cure	120°C (248 °F) cure
Shear Strength (MPa)	4.88	4.09

Flexural (BS EN ISO 14125:1998)* - Fibre-Reinforced Plastic Composites – determination of Flexural Properties (4 point bend test)

	80°C (176 °F)cure	120°C (248 °F) cure
Flexural Strength (MPa)	261.4	246.26
Flexural Modulus (GPa)	448.43	476.44

* All mechanical properties tested on standard laminate (1 ply RP101 / 2mm Rapi-Core / 1 Ply RP101)



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STORAGE

The Rapi-Core should be supported at either end so that the material does not initiate premature resin flow through the fabric.

The self-impregnation of Rapi-Core will occur over a period of time at ambient temperature 20°C (and this can compromise its ability to generate high quality laminates as the air breathing properties decrease. Self-impregnation will vary from product to product but at ambient temperature (20°C) self-impregnation will occur in approximately 1 week.

Out life of resin is 30 days ambient temperature (20°C).

Refrigerated storage life is 12 months at –18°C (0°F)

HANDLING SAFETY

Rapi-Core contains epoxy resin, which can cause allergic reactions by skin contact. Avoid prolonged or repeated contact with skin – wear disposable nitrile gloves.

Wash the skin thoroughly with soap and water or resin removing cream after handling. Do not use solvents for cleaning skin.

Amber Composites Ltd produces a separate full Material Safety Data Sheet for this product. Please ensure that you have the correct Material Data Sheet to hand for the materials you are using before commencing work.

FURTHER INFORMATION - PROCESSING DETAILS

Please contact Amber Composites for additional information.

This is not a specification. The information given in this data sheet in relation to the performance, storage and other characteristics of the product is based on results gained from experience and tests and is believed to be accurate. Given, however, that conditions of use and storage will vary, Amber Composites will not be liable for any loss or damage resulting from reliance upon such information. The purchaser is recommended to carry out his own tests to establish the suitability of the product for its particular purpose. The use of the product in certain processes may require third party consent.